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AUTHOR Convey, John J.
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ABSTRACT

A semantic differential containing two concepts and seven bipolar adjective scales consisting entirely of evaluative adjectives was used to obtain evaluative feedback on instructional materials from 193 deaf, first year college students. A factor analysis of the responses yielded a single factor labeled Evaluation when each adjective scale was averaged over the two concepts. When each scale by concept combination was used as a variable, a factor analysis yielded two factors defined by the scales within each concept. The results indicated that the students responded to the scales in a unidimensional manner and were able to differentiate between the two concepts. Findings lend support to the appropriateness of using the semantic differential for evaluation purposes with deaf students. (Author)

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DEAF STUDENTS' USE OF SEMANTIC DIFFERENTIAL FOR EVALUATION

John J. Convey
Catholic University of America

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Author Address:

John J. Convey, Ph.D., Chairman
Educational Psychology & Evaluation
School of Education
The Catholic University of America
Washington, DC 20064

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SEMANTIC DIFFERENTIAL FOR EVALUATION

The semantic differential (Osgood, Suci, & Tannenbaum, 1957) originally was designed to assess the dimensionality of the connotative meaning of a group of concepts. Typically, a large number of heterogeneous concepts were selected along with a heterogeneous group of bipolar adjective scales representing several dimensions of meaning. A factor analysis of the interscale correlation matrix usually produced three major factors labeled by Osgood and his associates (1957), as Evaluation, Potency, and Activity. These labels were applied after inspecting the adjectives that clustered under each factor. For example, the Evaluation factor contained adjective pairs like good-bad, valuable-worthless, pleasant-unpleasant, happy-sad, and fair-unfair; the Potency factor contained pairs like hard-soft, strong-weak, and large-small; and the Activity factor contained pairs like active-passive, fast-slow, and sharp-dull. Many of the early studies involving the semantic differential focused on this application of the technique (see, Snider & Osgood, 1969). In these studies, typically Potency and Activity accounted for less variance than Evaluation (Osgood, May, & Miron, 1975).

The semantic differential also has been used for measuring attitudes (Maguire, 1973; Mayerberg & Bean, 1978). For example, it has been used to describe the structure of children's attitudes toward school (Yamamoto, Thomas, & Wiersma, 1969), and for evaluating instructional outcomes (Hecht,

1971), instructional programs (Carver & Phipps, 1969), and individual lessons (Evans, 1970). Typically in this application, instruments contain homogeneous concepts representative of the domain of interest, rather than heterogeneous concepts. Often bipolar adjective scales representing the three major dimensions are employed. However, Davis (1977) has suggested that the semantic differential should contain only evaluative adjectives when used specifically for evaluation purposes.

The use of the semantic differential with deaf students and with other special education students apparently has been limited. Thomas and Yamamoto (1972) used the semantic differential to investigate the dimensionality of connotative meaning of retarded, disturbed, blind, and deaf children. Only a few studies have been reported using exclusively deaf students (Holmes & Green, 1974; Green & Miron, 1971; Green & Shephard, 1973). Generally, these latter studies found the presence of Evaluation and Potency factors among deaf students ages seven to 18, while other factors, such as Activity, Quantity, Warmth, and Noise, that were found in studies with hearing children (DiVesta, 1966) were ill-defined or not evident at all. In addition, more well-defined structures were found with older deaf children than with younger ones (Holmes & Green, 1974), and structures were more similar to those of hearing children when people concepts (Classmates, Parent, Teacher, Myself) were used than when curriculum concepts (Social Studies, Language, Science, Mathematics) were used (Thomas & Yamamoto, 1972). The only study found that used the semantic differential as an evaluative instrument with the deaf was Bolton and Brown's (1971) assessment of the work

attitudes of rehabilitation clients. Although the semantic differential has been used sucessfully to obtain evaluative feedback with hearing students, its use for this purpose with deaf students has not been reported.

Why the semantic differential has not been used more as an evaluative tool with the deaf is not clear. A semantic differential is easy to construct and administer, and subjects generally enjoy taking it (Nunnally, 1978). For deaf students who may have difficulty expressing themselves in writing or who may have difficulty interpreting items commonly found in Likert type rating scales, the semantic differential seems to be a useful technique to tap attitudes which may be quite complex and otherwise difficult for deaf students to explain. These qualities, along with the repeated findings of a strong Evaluation factor when the semantic differential is used for any purpose, would seem to make this technique a desirable evaluation tool. Green (1974) has noted that while the number and diversity of adjectives available to deaf students are less than the number and diversity available to hearing students of the same age, the number available still is substantial. This finding along with the results of those studies which have used the semantic differential with the deaf to assess connotative meaning ought to encourage its use as an evaluation tool with the deaf.

The purpose of this study was to determine the suitability of a semantic differential to obtain evaluative feedback from deaf college students concerning specific instructional materials. Two concepts and seven bipolar adjective scales were used. Only evaluative adjectives were selected. It was expected that an analysis of the responses would

result in a single factor, and would indicate that the students were able to differentiate between the two related, but different, concepts.

Method

The subjects were 193 deaf, first year college students enrolled in a course on personal hygiene. Following the completion of a unit on drug abuse, the students were asked to complete a questionnaire which requested feedback concerning their assessment of the unit. Embedded within the questionnaire was the semantic differential instrument.

The concepts used were Drugs and Drug Abuse Book. The latter concept which is well-defined was chosen in order to obtain feedback about the book which was developed specifically for the drug abuse unit. The former concept which is more complex than the latter was used not only because of its relation to the unit, but also because it was likely to produce a different response set by the students. Some students were likely to interpret the concept positively, seeing drugs as helpful things, while other students were likely to interpret it negatively, seeing drugs in the light of drug abuse. The ability of the students to discriminate between the two concepts would help to support the usefulness of the semantic differential as an evaluative tool for these students.

The seven bipolar adjective scales used were: good-bad, valuable-worthless, right-wrong, useful-useless, friendly-unfriendly, pleasant-unpleasant, and important-unimportant. These adjectives have been found to be representative of the Evaluation factor (Osgood, Suci, & Tannenbaum, 1957; Snider & Osgood, 1969). Each adjective scale contained seven steps.

Two principal axis factor analyses were performed on the resulting

data. In the first analysis, a people by scales data matrix was obtained by averaging each scale over the two concepts. The corresponding inter-scale (7 x 7) correlation matrix was factored analyzed. Since the scales used were presumed to be unidimensional, one factor was expected. In the second analysis, a stringing-out procedure (Maguire, 1973) was employed to obtain the data matrix. In this procedure, each concept-scale combination was treated as a variable and the resulting intervariable (14 x 14) correlation matrix was factored analyzed. Mayerberg and Bean (1978) have recommended this stringing-out approach when dealing with evaluation applications of the semantic differential, since often an existing concept-scale interaction which provides important information to the evaluator is obscured by averaging over concepts as was done in the first analysis. Mayerberg and Bean also argue that such a stringing-out procedure enables the evaluator to detect the presence of factors defined by scales within concepts and those defined by scales across concepts.

In both analyses, the number of eigenvalues greater than 1.00 and the scree criterion (Cattell, 1966) were used to determine the number of factors. A varimax rotation was used when more than one factor was present in order to aid in the interpretation of the factors. The data were analyzed using the FACTOR subroutine from the Statistical Package for the Social Sciences (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975).

Results

The first principal axis factor analysis produced a single factor ($\lambda_1 = 4.45$) accounting for 63.6% of the common variance. Table 1 presents the factor loadings for each of the seven scales. While all scales loaded

highly on the factor, the adjectives good, right, useful, and important has the highest loadings. The results of this first analysis were consistent with the assumption that the seven scales assessed the Evaluation dimension.

Insert Table 1 about here

The second factor analysis produced two eigenvalues greater than 1.00 ($\lambda_1 = 5.52$ and $\lambda_2 = 3.79$). These accounted for 39.4% and 27.1% of the common variance, respectively. Table 2 presents the rotated factor loadings, the mean, and the standard deviation for each concept-scale combination. The two factors obtained are both defined by scales within concepts and are strikingly close to simple structure (Harman, 1967). Factor I clearly can be labeled the Drug factor, and Factor II clearly can be labeled the Drug Abuse Book factor. Factors defined by scales across concepts were not present, and they were not anticipated due to the assumed unidimensionality of the scales used.

Insert Table 2 about here

Inspection of the means and standard deviations in Table 2 supports the expectation that some students would respond in a different manner to the two concepts. Generally, students were very positive toward the drug abuse book, but quite mixed about drugs. The larger standard deviations for the first concept indicate a larger polarity in student responses towards drugs than toward the drug abuse book.

Discussion

The results lend support to the appropriateness of using the semantic differential as an evaluative took with deaf students. When the presumed unidimensional scales were averaged over the two concepts, a factor analysis produced a single factor which clearly can be labeled Evaluation. Since a single factor was anticipated, the occurrence of more factors would have been discouraging.

More importantly, when the stringing-out procedure was used to generate the initial data matrix, the analysis revealed that the subjects had responded in a different way to the two concepts and had replied along a unidimensional factor within each concept. It is important that the respondent group be able to differentiate between concepts when warranted. The semantic differential has the capability of detecting such differences in attitude, since the scales can be summed under each concept separately. The fact that the subjects in this study did respond in a different manner to the two essentially different concepts is very encouraging for the future use of the semantic differential in evaluations involving the deaf.

While the results of this study are encouraging, much still needs to be determined about the effectiveness of the semantic differential as an evaluative tool with deaf subjects. Additional studies using the semantic differential in evaluation situations should be conducted with deaf populations. In addition to shedding more light on the evaluative uses of the semantic differential, research is needed concerning which adjectives are familiar to different age groups and how these adjectives behave in a semantic differential with deaf populations. This information can be

valuable to evaluators or teachers in planning future instruments. A word of caution is appropriate here. Heise (1969) indicated that the behavior of adjectives should always be examined in the situation for which they are intended, since adjective behavior in a semantic differential may vary according to the concepts employed or the population for which the instrument is intended. Also, while the stringing-out procedure described in this study produced the most interpretable results, other analytic approaches and other stringing-out procedures are available (see, Davis, 1977; Maguire, 1973). The efficacy of these methods in analyzing data obtained from deaf subjects should be explored.

In conclusion, the semantic differential appears to be a useful tool for obtaining evaluative information from deaf subjects. It has been shown to be useful with regular education students, and it would appear also to be useful with other special education students. In applied settings, the use of a factor analysis is not necessary for scoring or interpretation of the results. Factor analysis was used in this study to obtain confirmatory data concerning the use of the instrument by the students. Scoring of the instrument in applied settings simply involves summing the scale values for each evaluative adjective pair under each concept. The ease in scoring as well as the ease in constructing and interpreting the instrument, and the general attractiveness that it has for the students, make the semantic differential a highly desirable tool for evaluators, researchers, and teachers.

References

Bolton, B., & Brown, K. The development of an instrument to assess work attitudes of deaf rehabilitation clients. Journal of Rehabilitation of the Deaf, 1971, 4(4), 18-29.

Carver, F., & Phipps, L. The semantic differential and instructional evaluation. Illinois School Research, 1969, 5, 42-45.

Cattell, R. The meaning and strategic use of factor analysis. In R. Cattell (Ed.) Handbook of multivariate experimental psychology. Chicago: Rand McNally, 1966.

Davis, R. W. Development of an appropriate method for applying the semantic differential to the measurement of affective outcomes of instruction. A paper presented at the annual meeting of the National Council on Measurement in Education, New York, April, 1977.

DiVesta, F. J. A developmental study of the semantic differential of children. Journal of Verbal Learning and Verbal Behavior, 1966, 5, 249-259.

Evans, G. Use of the semantic differential technique to study attitudes during classroom lessons. Interchange, 1970, 1, 96-106.

Green, W. B. The development of semantic differential scales for deaf children. American Annals of the Deaf, 1974, 119, 361-364.

Green, W. B., & Miron, M. S. The development of semantic differential scales for deaf children. Paper presented at the annual meeting of the American Speech and Hearing Association, Chicago, 1971.

Green, W. B., Shepherd, D. C. The semantic structure in deaf children. Paper presented at the annual meeting of the American Speech and Hearing Association, Detroit, 1973.

Harman, H. H. Modern factor analysis. Chicago: University of Chicago Press, 1967.

Hecht, A. A semantic differential evaluation of attitudinal outcomes of introductory physical science. (Doctoral dissertation, University of Illinois, 1970). Dissertation Abstracts International, 1971, 31, 4576A. (University Microfilms No. 71-5,123).

Heise, D. R. Some methodological issues in semantic differential research. Psychological Bulletin, 1969, 72, 406-422.

Holmes, D. W., & Green, W. B. A developmental study of deaf children's semantic system. A paper presented at the annual meeting of the American Speech and Hearing Association, Las Vegas, 1974. (ERIC Document Reproduction Service No. ED 107 065).

Maguire, T. O. Semantic differential methodology for the structuring of attitudes. American Educational Research Journal, 1973, 10, 295-306.

Mayerberg, C. K., & Bean, A. G. Two types of factors in the analysis of semantic differential attitude data. Applied Psychological Measurement, 1978, 2, 469-480.

Nie, N. H., Hull, C. H., Jenkins, J. G., Steinbrenner, K., & Bent, D. H. Statistical package for the social sciences. New York: McGraw-Hill, 1975.

Nunnally, J. C. Psychometric theory (2nd ed.) New York: McGraw-Hill, 1978.

Osgood, C. E., May, W. H., & Miron, M. S. Crosscultural universals of affective meaning. Urbana: University of Illinois Press, 1975.

Osgood, C. E., Suci, G. J., & Tannenbaum, P. H. The measurement of meaning. Urbana: University of Illinois Press, 1957.

Snider, J. G., & Osgood, C. E. Semantic differential technique. Chicago: Aldine, 1969.

Thomas, E. C., & Yamamoto, K. A note of the semantic structures of the school-related attitudes in exceptional children. Journal of Psychology, 1972, 81, 225-234.

Yamamoto, K., Thomas, E. C., & Wiersma, J. Dimensions of school-related attitudes in middle-school age students. Psychology in the Schools, 1969, 6, 375-378.

Table 1

Loadings from Analysis of Scales

Averaged Over Concepts

Scale	Loading
Good	.797
Valuable	.634
Right	.857
Useful	.806
Friendly	.652
Pleasant	.708
Important	.842

Table 2

Factor Loadings, Means, and Standard Deviations

From Stringing Out Analysis

Concept	Scale	I	II	Mean	S.D.
	Good	.851	-.112	3.43	2.00
	Valuable	.739	-.085	3.67	2.10
	Right	.919	-.072	3.47	1.94
Drugs	Useful	.844	-.033	3.80	2.00
	Friendly	.799	-.031	3.36	1.84
	Pleasant	.758	-.081	3.53	1.97
	Important	.844	-.078	3.97	2.21
	Good	-.062	.806	6.09	1.16
	Valuable	-.002	.531	5.72	1.55
Drug	Right	-.087	.785	5.94	1.19
Abuse	Useful	-.062	.788	6.02	1.23
Book	Friendly	-.137	.626	5.56	1.28
	Pleasant	.002	.733	5.69	1.34
	Important	-.107	.798	6.12	1.19